REMARKS

Reconsideration of the present application is respectfully requested. Claims 1-6, 8-36, and 38-40 are currently pending.

Claims 1-4, 6, 9-15, 17, 21-23, 25-26, 28-36, and 39-40 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,870,670 to Ripley et al. ("Ripley") in view of U.S. Patent No. 6,714,776 to Birleson ("Birleson"). Independent claim 1 is directed to an image reject circuit which includes "a first amplitude detector for determining the amplitude of the output I signal", "a second amplitude detector for determining the amplitude of the output Q signal", and "means for determining the difference between the amplitudes of the output I and Q signals, to produce a tuning signal for tuning the phase shifting network to bring the difference between the amplitudes of the output I and Q signals towards a desired level."

Regarding independent claim 1, the Office Action acknowledges that Ripley does not teach "an amplitude detector for determining the amplitude of the output I signal and an amplitude detector for determining the amplitude of the output Q signal, or determining the difference between the amplitude of the output I and Q signals to bring the difference between the amplitudes of the output I and Q signals towards a desired level." The Office Action asserts that column 10, lines 52-64 of Birleson teaches "an amplitude detector for determining the amplitude of the output I signal and an amplitude detector for determining the amplitude of the output Q signal and determining the differences between the amplitude of the output I and Q signals to bring the difference between the amplitudes of the I and Q signals towards a desired level." The Office Action further asserts that "it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the invention adapt to include an amplitude detector for determining the amplitude of the output I signal and an amplitude of the output Q signal, and determining the difference between the amplitude of the output I and Q signals to bring the difference between the amplitudes of the I and Q signals towards a desired level because this would allow for adjustment of phase and/or amplitude of input signals provided for improving the image rejection." Applicant respectfully disagrees with these assertions by the Office Action.

Birleson describes a single conversion tuner having image rejection circuitry including separate I and Q signal paths. As described in column 2, lines 59-63, Birleson describes that the separate I and Q signal paths are phase shifted and summed together to substantially cancel an image channel from the signals. Column 2, lines 47-58 and column 8, lines 28-44 of Birleson describe the use of an error correction feedback loop, in which a test signal is fed into an input summer, to compensate for errors due to the use of unmatched circuit components in separate signal paths. The cited portion of Birleson, column 10, lines 52-64, describes a gain control circuit for amplifiers 216 and 226 in which the outputs of amplifiers 216 and 222 are fed to peak detectors. Birleson further describes that the output of the peak detectors are input into a difference amplifier 314, and then into an integrator 316. Birleson further describes that the integrator 316 generates gain control voltages based on the difference in gain detected by the difference amplifier, and that the gain control voltages are used to adjust the gain of amplifier 216 and amplifier 226 to equalize the gain of the I and Q signal paths. Applicant respectfully submits that there is no teaching or suggestion in Birleson of determining the difference between the amplitudes of output I and Q signals to produce a <u>tuning signal for tuning a phase shifting network</u> as found in independent claim 1.

Furthermore, Applicant respectfully submits that there is no teaching or suggestion nor would it have been obvious to one of ordinary skill in the art at the time of the invention to adapt the teachings of Ripley to include an amplitude detector as described in Birleson. Ripley describes an image reject circuit whereby a phase shifting network 138 in an intermediate frequency (IF) path is complemented by a phase shifting network 131 in a local oscillator (LO) path. Column 1, line 65 to column 2, line 1 of Ripley describes that the phase comparison method of Ripley relies on a <u>constant</u> amplitude in the LO path in which phase shifting network 131 resides. Accordingly, Applicant respectfully submits that Ripley teaches away from using an amplitude difference to produce a tuning signal for tuning a phase shifting network. Applicant respectfully submits that it would not have been obvious to one of ordinary skill in the art to adapt the teachings of Ripley with those of Birleson to arrive at the invention of independent claim 1. For at least the foregoing reasons, Applicant respectfully submits that independent claim 1 distinguishes over Ripley in view of Birleson and requests that the 35 U.S.C. 103(a) rejection of independent claim 1 be withdrawn.

Independent claim 22 includes the features of "determining the difference between the amplitudes of the output I and Q signals to produce a tuning signal" and "tuning the phase shifting network using the tuning signal to bring the difference between the amplitudes of the output I and Q signals towards a desired level." Independent claim 34 includes the feature of "wherein the phase shifting network further comprises a tuning input for receiving a tuning signal for adjusting an RC time constant of the phase shifting network, wherein the tuning signal comprises the difference between amplitudes of the output in-phase (I) signal and the output quadrature (Q) signal." Independent claim 39 includes the feature of "wherein the phase shifting network further comprises a tuning input for receiving a tuning signal for adjusting an RL time constant of the phase shifting network, wherein the tuning signal comprises the difference between amplitudes of the output in-phase (I) signal and the output quadrature (Q) signal." Independent claim 40 includes the feature of "wherein the phase shifting network further comprises a tuning input for receiving a tuning signal for adjusting an LC time constant of the phase shifting network, wherein the tuning signal comprises the difference between amplitudes of the output in-phase (I) signal and the output quadrature (Q) signal." For similar reasons as those discussed with respect to independent claim 1, Applicant respectfully submits that independent claims 22, 34, 39, and 40 distinguish over Ripley in view of Birleson and requests that the 35 U.S.C. 103(a) rejection of independent claims 22, 34, 39, and 40 be withdrawn.

Claims 2-4, 6, 9-15, 17, 21, 23, 25-26, 28-33, and 35-36 are dependent upon and include the features of their respective independent claims 1, 22, and 34. For at least the reasons as discussed with respect to independent claims 1, 22, and 34, Applicant respectfully submits that claims 2-4, 6, 9-15, 17, 21, 23, 25-26, 28-33, and 35-36 distinguish over Ripley in view of Birleson and requests that the 35 U.S.C. 103(a) rejection of claims 2-4, 6, 9-15, 17, 21, 23, 25-26, 28-33, and 35-36 be withdrawn.

Claims 5, 11, and 24 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Ripley in view of Birleson and WO 99/16179 to Moore et al. ("Moore"). The Office Action refers to page 7, lines 5-7 of Moore as teaching "a reverse polarity junction diode, which is tuned in accordance with a tuning signal." The cited portion of Moore describes a phase lead network and a phase lag network that each include a varactor diode. Claims 5, 11, and 24 are dependent upon and include the features of their respective independent claims 1 and 22. As

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discussed with respect to independent claims 1 and 22, Ripley in view of Birleson fails to teach or suggest the features of independent claims 1 and 22. Applicant respectfully submits that Moore also fails to teach or suggest the aforementioned features of independent claims 1 and 22. For at least the foregoing reasons, Applicant respectfully submits that claims 5, 11, and 24 distinguish over Ripley in view of Birleson and Moore and requests that the 35 U.S.C. 103(a) rejection of claims 5, 11, and 24 be withdrawn.

Claims 8, 16, 18-20, 27, and 38 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Ripley in view of Birleson and U.S. Patent No. 6,226,509 to Mole et al. ("Mole"). The Office Action refers to column 12, lines 15-18 & 21-25 of Mole as teaching "transistors operating in their triode region." The cited portion of Mole describes a biasing circuit enabling dc bias to be fed to the bases of input signal transistors while allowing an RF signal to be AC coupled and quadrature split from a low impedance source. The cited portion of Mole further describes supplying a biasing voltage to the bases of the transistors through separate circuit paths comprising a series combination of a first resistor and a second resistor. Claims 8, 16, 18-20, 27, and 38 are dependent upon and include the features of their respective independent claims 1, 22, and 34. As discussed with respect to independent claims 1, 22, and 34, Ripley in view of Birleson fails to teach or suggest the features of independent claims 1, 22, and 34. Applicant respectfully submits that Mole also fails to teach or suggest the aforementioned features of independent claims 1, 22, and 34. For at least the foregoing reasons, Applicant respectfully submits that claims 8, 16, 18-20, 27, and 38 distinguish over Ripley in view of Birleson and Mole and requests that the 35 U.S.C. 103(a) rejection of claims 8, 16, 18-20, 27, and 38 be withdrawn.

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Dated: October 13, 2004   Respectfully submitted,

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